Timing of Stellar Brightness Periodic Variations as a Method of Earth-like Planets Detection

Grigory Beskin
Special Astrophysics Observatory
RUSSIA
beskin@sao.ru

In order to detect Earth-like planets the use of high time resolution photometry of variable stars is proposed. Fixed phase (for example, maximum or minimum) of periodical variations of stellar brightness is registered in different moments due to change of distance to observer during the revolution around barycenter of the system “star – planet”. This time shift is of order of a few millisecond for Earth-like case. Possibility of detection of such effect by means of photometry with high time resolution depends on variability amplitude, period and stellar magnitude. These possibilities for different kinds of pulsating stars are analyzed. Parameters of periodical variability of white dwarfs (as a result of pulsation as well as rotation) give possibility to detect discussed time shift in observations by 1-2 meter telescope during several months. Possible origins of Earth-like planets orbiting white dwarfs and their habitability are discussed.